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| APPLICATION NO | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO | CONFIRMATION NO |
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| 09/980,345 | 11/30/2001 | Michel Perrat | 366325-519 | 3179 |

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ALLEN BLOOM
C/O DECHERT
PRINCETON PIKE CORPORATION CENTER
P.O. BOX 5218
PRINCETON, NJ 08543-5218

| EXAMINER | |
|---|---|
| MENON, KRISHNAN S | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1723 | 7 |

DATE MAILED: 02/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| Application No. | Applicant(s) |
|---|---|
| 09/980 345 | PERROT M CHEL |

# Office Action Summary

| Examiner | Art Unit |
|---|---|
| Krishnan S Menon | 1723 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *15 May 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a)☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
4)☐ Interview Summary (PTO-413) Paper No(s).
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 1,2 and 4 -10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schucker (US 5,430,224) in view of Feimer et al (US 4,962,270).

Schucker (224) teaches super-critical solvent extraction device with injection points, draw off points, membrane separation elements in series (col 5 lines 8-25), and associated pumps (see figure 1), maintaining heat, concentrations and pressure above critical pressure (col 2 line 46 – col 3 line 15) as in instant claim 1. Schucker (224) also teaches hollow fiber membrane as in instant claim 2 (col 4 lines 46-56), in series and in counter current arrangement (col 4 lines 57-col 5 lines 23). The solvent power of the solvent is held constant in each area by having constant trans-membrane pressure as in instant claim 4 (col 6 line 53 -col 7 line 5). Pressure is maintained as in instant claim

4, balanced as in instant claim 9 and 10, and enthalpy as in instant claim 6 is maintained (col 2 line 46- col 3 line 15). Pumping system as in instant claim 7 (fig 1, col 2 line 46- col 3 line 15

The primary reference teaches all the elements of the instant claims except for the specific injection/draw-off points in the multi-stage design as in instant claim 1, flow regulations specifically using a volumetric pump as in instant claim 8, and the change in solvent power of the solvent in each area in the direction of flow as in instant claim 5. Feimer (270) teaches a multi-stage series pervaporation process for separation of a multi-component mixture using membrane separation elements, which shows injection and multiple draw-off points depending on the number of components to be separated (fig 1 and 2; 4 line 63-col 5 line67). It would be obvious to one of ordinary skill in the art at the time of invention to design the multi-stage device with appropriately placed injection and draw-off points as taught by Feimer (270) in the teachings of Schucker (224) for a multi-component mixture separation. It would also be obvious to one of ordinary skill in the art at the time of invention to have volumetric pumps for the pumps used to control the flow rates in the teachings of Schucker (224). Regarding the change in solvent power of the solvent in the direction of flow in each area as in instant claim 5, it would be obvious to one of ordinary skill in the art at the time of invention that the solvent power would decrease in the direction of flow because the [illegible] pressure would decrease in the direction of flow and the solvent would pick up more and more solute in the direction of flow, and the concentration gradient constitutes the driving force (see Schucker col 6 lines 34-44).

2. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schicker (US 5,430,224) in view of Feimer et al (US 4,962,270) as applied to claim 1 above, and further in view of Sykora et al (US 5,868,935).

Schicker (US 5,430,224) in view of Feimer et al (US 4,962,270) does not teach polypropylene as the membrane material. Sirkar ('935) teaches polypropylene membrane in an extraction device for separation of components from ionic mixtures (col 9 lines 11-48). It would be obvious to one of ordinary skill in the art at the time of invention to use a polypropylene membrane for solvent extraction as taught by Sirkar ('935) in the teaching of Schucker ('224) as alternate for non-hydrocarbon extractions.

## *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Subramaniam et al (US 6,113,795), Rojey et al (US 4,925,459) and JP 1-189301 teach super-critical solvent extraction with membranes. Zosel (US 3,969,196) teaches super-critical solvent extraction using multi-stage tray column.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 703-305-5999. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccesstul, the examiner's supervisor, Wanda L Walker can be reached on 703-308-0457. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Krishnan S. Menon
Patent Examiner
February 10, 2003

N. L. WALKER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700